

Vane Damper

FYN-M1 Series



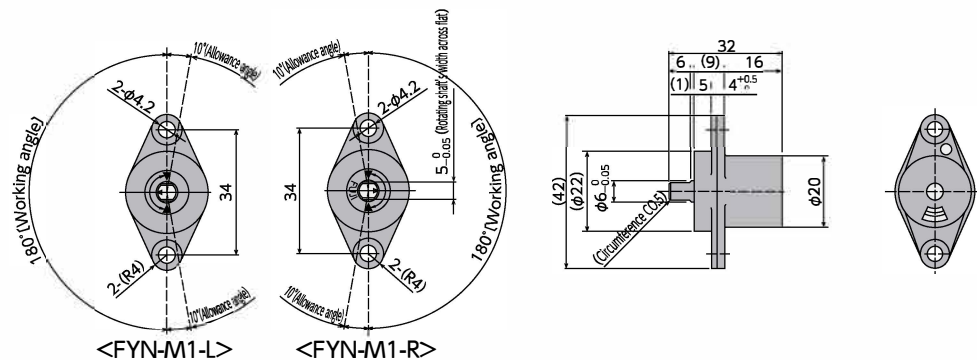
- * Max. angle 180°
- * Max. cycle rate 6cycle /min
- * Operating temperature -5~50°C
- * Weight 17±2g
- * Main body Polybutylene terephthalate (PBT)
- * Cap material Polybutylene terephthalate (PBT)

Specifications

Model	Max. torque	Reverse torque	Damping direction
FYN-M1-R152	0.15 N·m	0.1 N·m or lower	Clockwise
FYN-M1-L152	(1.5 kgf·cm)	(1kgf·cm or lower)	Counter-clockwise
FYN-M1-R252	0.25 N·m	0.2 N·m or lower	Clockwise
FYN-M1-L252	(2.5 kgf·cm)	(2 kgf·cm or lower)	Counter-clockwise
FYN-M1-R352	0.35 N·m	0.2 N·m or lower	Clockwise
FYN-M1-L352	(3.5 kgf·cm)	(2 kgf·cm or lower)	Counter-clockwise
FYN-M1-R602	0.60 N·m	0.4 N·m or lower	Clockwise
FYN-M1-L602	(6.0kgf·cm)	(4 kgf·cm or lower)	Counter-clockwise

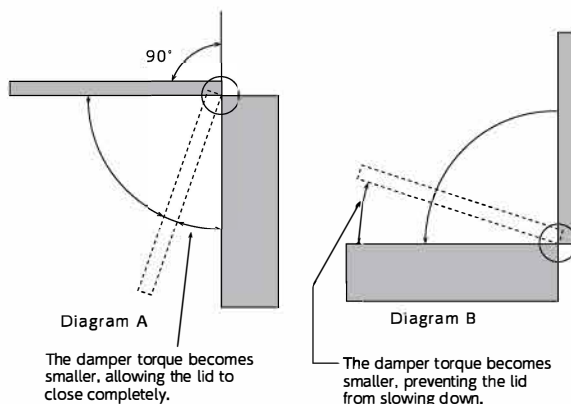
Note) Measured at 23°C±2°C

- * Rotating shaft material Zinc die-cast (ZDC)
- * Oil type Silicone oil
- * Cap colour R: Black L: Gray

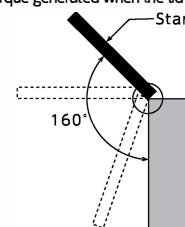
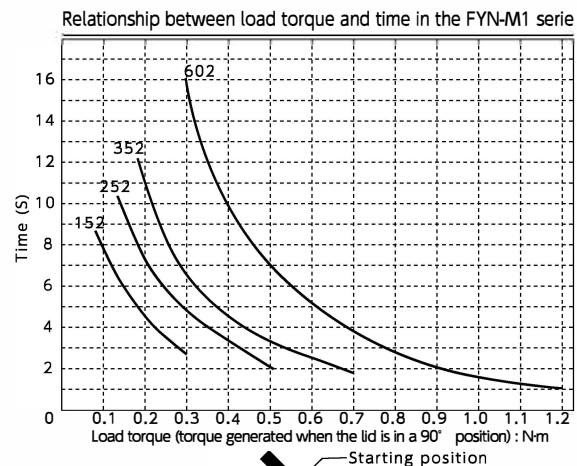


How to Use the Damper

- The FYN-M1 Series is designed to generate a large torque up to 90° in a closing lid, as shown in Diagram A, and the lid is able to close completely. However, when the lid is closed from a vertical position, as shown in Diagram B, the lid cannot be slowed down, as the torque becomes small just before the lid is completely closed.

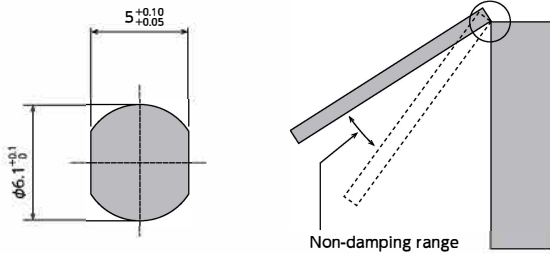


- Below is a graph showing the relationship between the load torque and the time when a lid is closed from a 160° angle, as shown in the diagram.



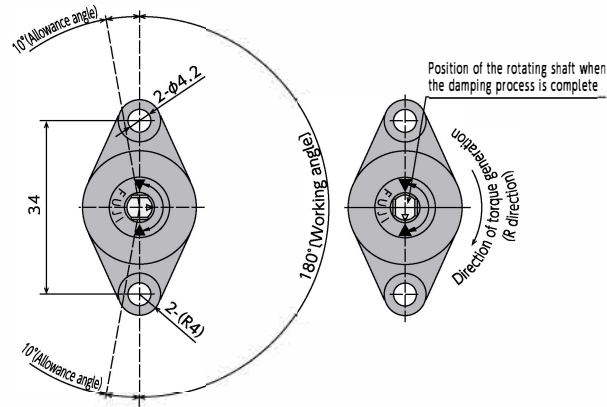
●Products specification might be changed without notice.

3. When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing.



<Recommended dimensions for a rotating shaft opening>

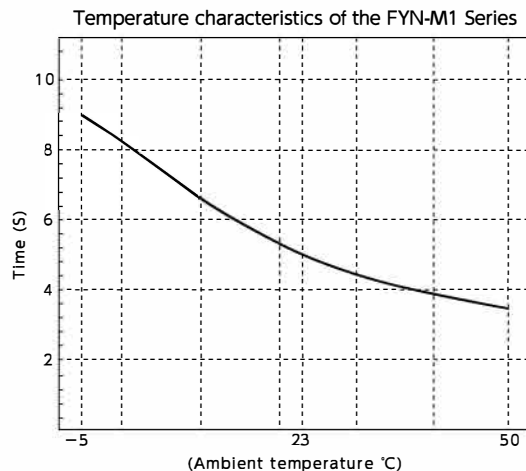
5. The standard for a damper's working angle is 180° with respect to the main body's attachment flange. Rotating the damper beyond this angle will cause damage to the damper. Please make sure that an external stopper is in place.



<FYN-M1-R>

4. The time it takes for a lid with a damper to close varies according to the ambient temperature. As the temperature increases, it takes less time, and as the temperature decreases, it will take longer for the lid to close. This is because the viscosity of the oil inside the damper changes according to the temperature. When the temperature returns to normal, the required time will return to normal as well. The temperature characteristics are shown in the graph below.

6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.



Vane Damper

FYN-P1 Series

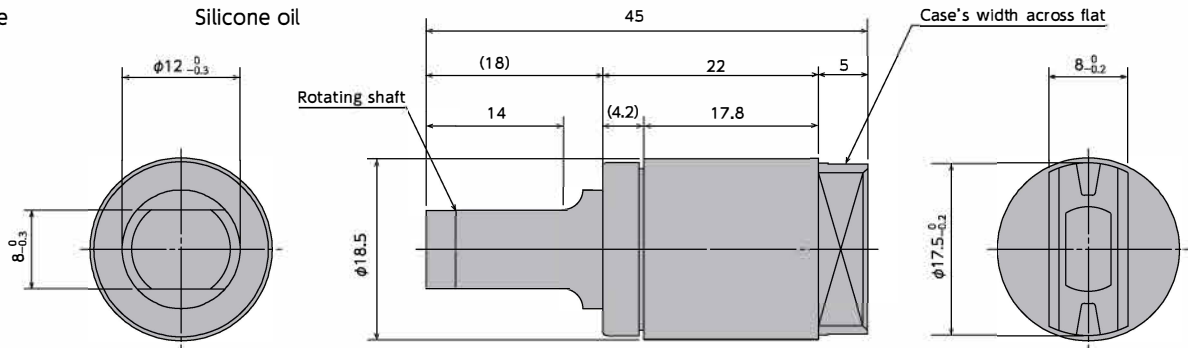


Specifications

Model	Max. torque	Reverse torque	Damping direction
FYN-P1-R103	1 N·m (10 kgf·cm)	0.3 N·m or lower (3 kgf·cm or lower)	Clockwise
FYN-P1-L103			Counter-clockwise
FYN-P1-R153	1.5 N·m (15 kgf·cm)	0.5 N·m or lower (5 kgf·cm or lower)	Clockwise
FYN-P1-L153			Counter-clockwise
FYN-P1-R183	1.8 N·m (18 kgf·cm)	0.8 N·m or lower (8 kgf·cm or lower)	Clockwise
FYN-P1-L183			Counter-clockwise

Note) Measured at 23°C±2°C

- * Max. angle 115°
- * Operating temperature -5~50°C
- * Weight 10.5±1g
- * Body and cap material Polybutylene terephthalate (PBT)
- * Rotating shaft material Polybutylene terephthalate (PBT)
- * Oil type Silicone oil



How to Use the Damper

1. FYN-P1 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly.

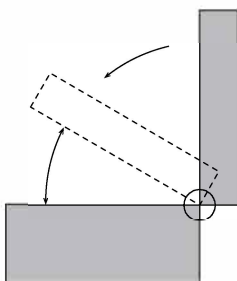


Diagram A

The damper torque becomes larger, preventing the lid from slowing down.

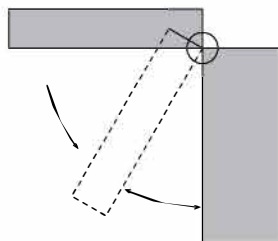


Diagram B

The damper torque becomes larger, preventing the lid from closing completely.

2. When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque.

Example)

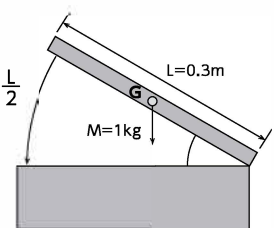
Lid mass M : 1kg

Lid dimensions L : 0.3m

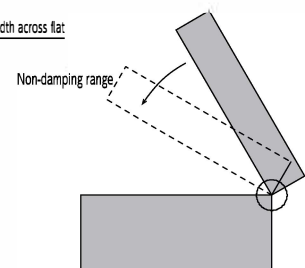
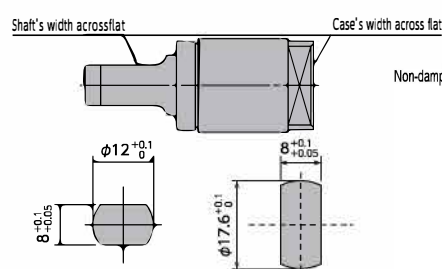
Gravity Center Position : Assumed as $\frac{1}{2}$

Load torque : $T=1 \times 9.8 \times 0.3 \div 2$
 $=1.47\text{N}\cdot\text{m}$

Based on the above calculation,
 FYN-P1-*153 is selected.

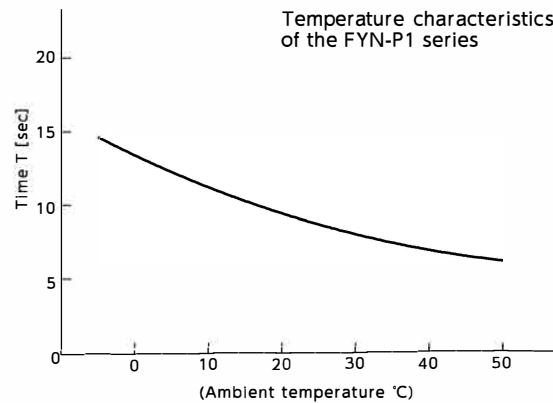


3. When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

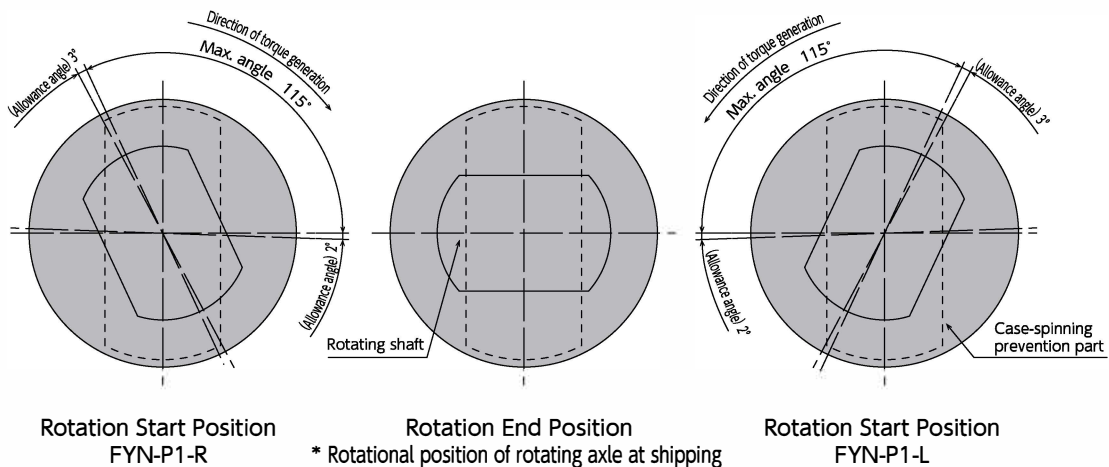


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The time it takes for the lid to close is shown in the graph to the right.



5. The damper's working angle is 115°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-N2 Series



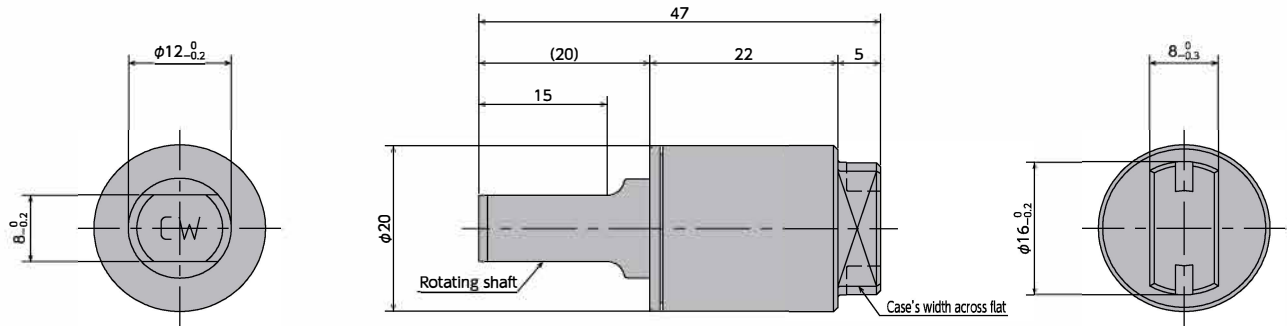
Specifications

Model	Max. torque	Reverse torque	Directions
FYN-N2-R103	1 N·m (10kgf·cm)	0.2 N·m or lower (2 kgf·cm or lower)	Clockwise (CW)
FYN-N2-L103			Counterclockwise (CCW)
FYN-N2-R203	2 N·m (20 kgf·cm)	0.4 N·m or lower (4 kgf·cm or lower)	Clockwise (CW)
FYN-N2-L203			Counterclockwise (CCW)
FYN-N2-R303	3 N·m (30 kgf·cm)	0.8 N·m or lower (8 kgf·cm or lower)	Clockwise (CW)
FYN-N2-L303			Counterclockwise (CCW)

Note) Measured at 23°C±2°C

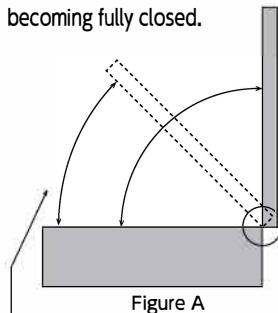
- * Max. angle 110°
- * Operating temperature -5~50°C
- * Weight 13±1g
- * Body and cap material Polybutylene terephthalate (PBT)

- * Rotating shaft material Polyamide (PA)
- * Oil type Silicone oil

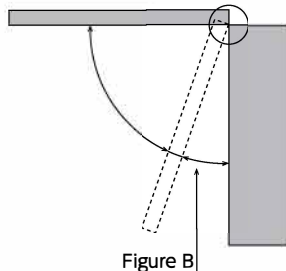


How to Use the Damper

1. FYN-N2 series has been designed so that when a lid is closing from a vertical position, as shown in Figure A, high torque is generated just before it closes completely. For a lid that closes from a horizontal position, as shown in Figure B, the strong torque generated just prior to a complete closure may prevent the lid from becoming fully closed.



Stronger damper torque allows the lid to close gently until it is fully closed.



Stronger damper torque prevents the lid from being fully closed.

2. When using a damper with a lid shown in the diagram, determine the damper torque based on the following selection calculation.

Example)

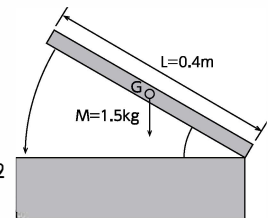
Lid weight M: 1.5 kg

Lid dimension L: 0.4 m

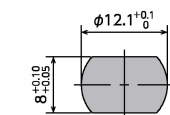
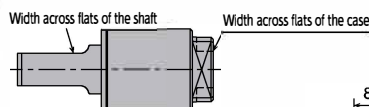
Gravity Center Position G: Assumed as $\frac{L}{2}$

Load torque: $T = 1.5 \times 9.8 \times 0.4 \div 2$
 $= 2.94 \text{ N} \cdot \text{m}$

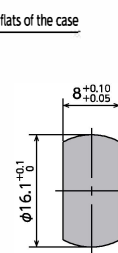
Based on the above calculation, select FYN-N2-303.



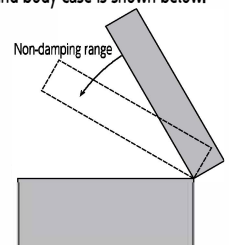
3. When connecting parts that are joined to the rotating shaft, ensure a snug fit. The lid will not decelerate as designed when closing if these parts are not connected properly. The dimensional tolerance for fixing the rotating shaft and body case is shown below.



(Recommended dimensions for mounting the rotating shaft)

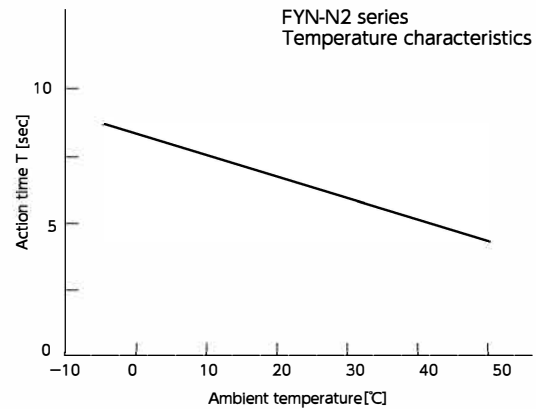


(Recommended dimensions for mounting the body case)

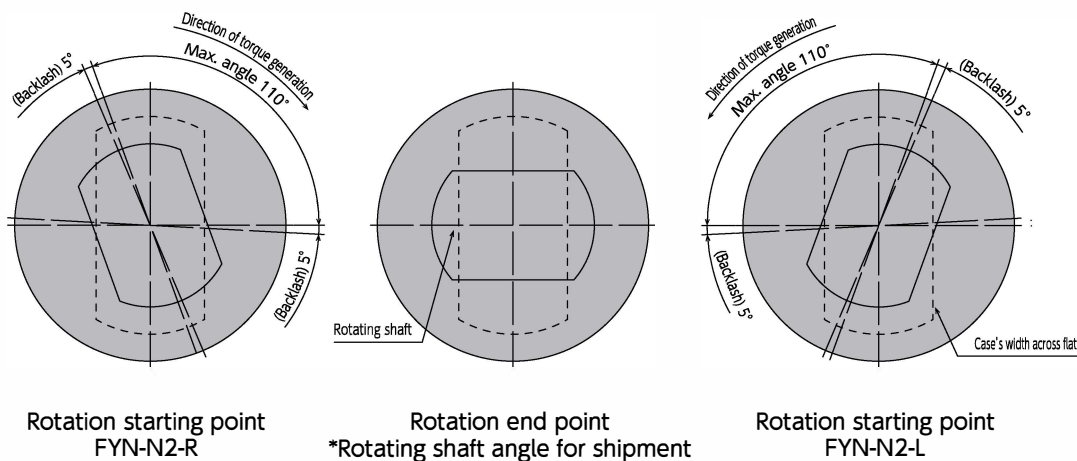


Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, damper characteristics weaken as the temperature goes up, and become stronger as the temperature goes down. This occurs because the viscosity of oil inside the damper is affected by the temperature change. Once the temperature returns to normal, so will the damper characteristics. Please refer to the right diagram for change in the action time for a free-closing lid.



5. The damper action angle is 110° as shown below. Rotating it beyond this angle will cause the damper to break. Ensure that an external stopper is in place. The action angle is based on the width across flats of the case on the back of the body. The rotation end point is at 90° on the basis of the width across flats of the case. (Refer to the figure below.)



6. There are dampers that generate torque in either the clockwise or counterclockwise direction when the rotating shaft is seen from the above. Select a model according to use.

Vane Damper

FYN-B1 Series



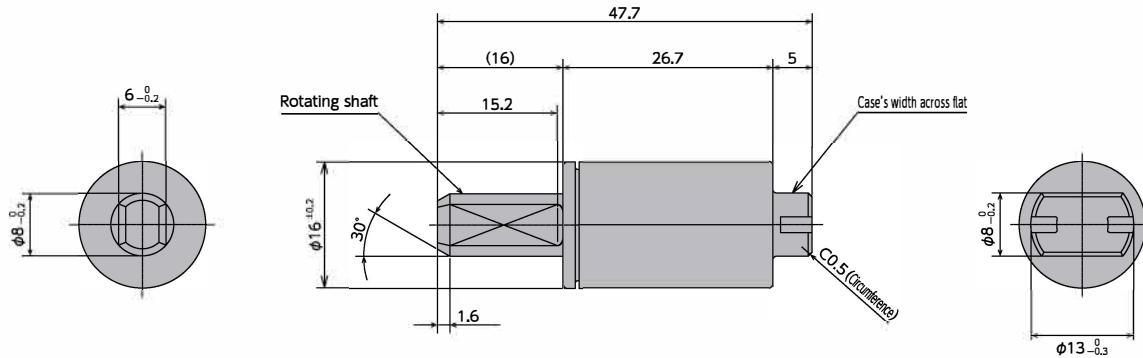
Specifications

Model	Max. torque	Reverse torque	Damping direction
FYN-B1-R502	0.5N·m (5kgf·cm)	0.3N·m or lower (3kgf·cm) or lower	Clockwise
FYN-B1-L502			Counter-clockwise
FYN-B1-R103	1N·m (10kgf·cm)	0.4N·m or lower (4kgf·cm) or lower	Clockwise
FYN-B1-L103			Counter-clockwise
FYN-B1-R153	1.5N·m (15kgf·cm)	0.5N·m or lower (5kgf·cm) or lower	Clockwise
FYN-B1-L153			Counter-clockwise

Note) Measured at 23°C±2°C

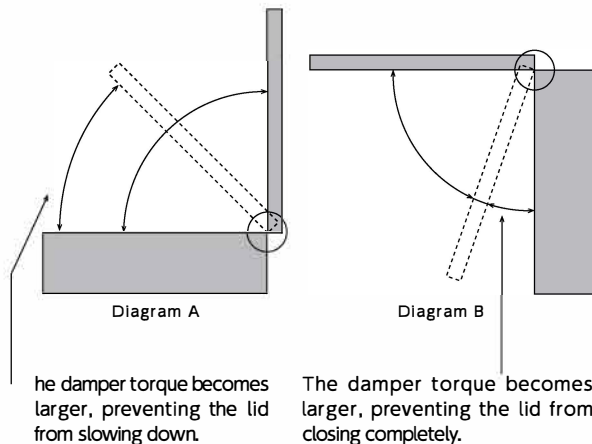
- *Max. angle 110°
- *Operating temperature -5~50°C
- *Weight 9±1g
- *Body and cap material Polybutylene terephthalate (PBT)

- *Rotating shaft material Polyphenylene Sulphide (PPS)
- *Oil type Silicone oil
- *R type has Black shaft / L type has white shaft



How to Use the Damper

1. FYN-B1 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly.



2. When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque. Example)

Lid mass M : 1kg

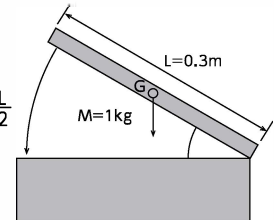
Lid dimensions L: 0.3m

Gravity Center Position : Assumed as $\frac{L}{2}$

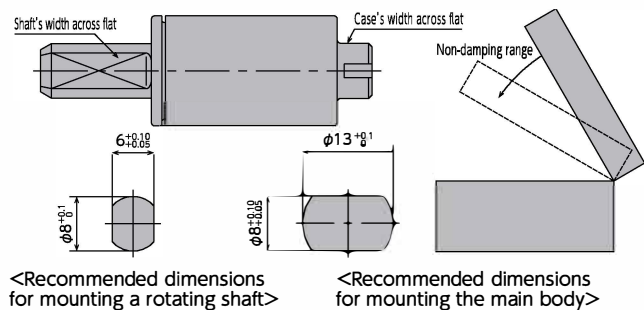
Load torque : $T = 1.5 \times 0.4 \times 9.8 \div 2$

$= 2.94 \text{ N} \cdot \text{m}$

Based on the above calculation, FYN-B1*153 is selected.

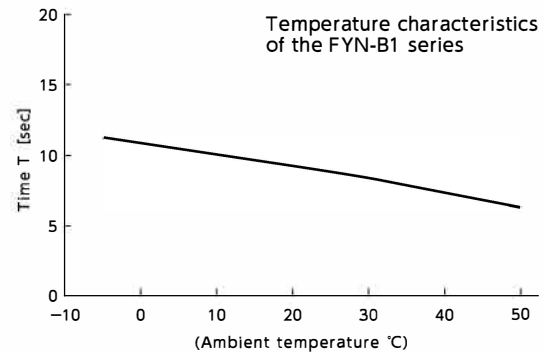


3. When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

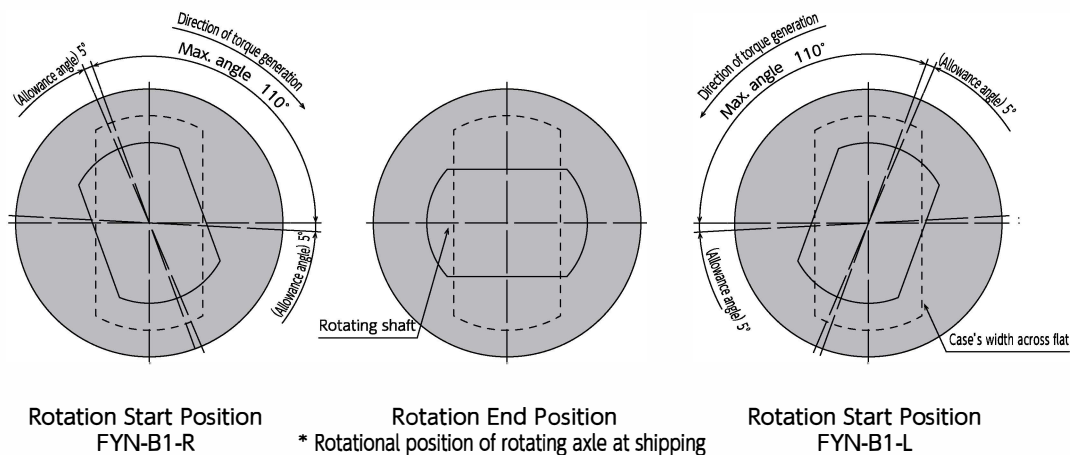


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The changes in the time it takes for the lid to close are shown in the graph to the right.



5. The damper's working angle is 110°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-U1 Series



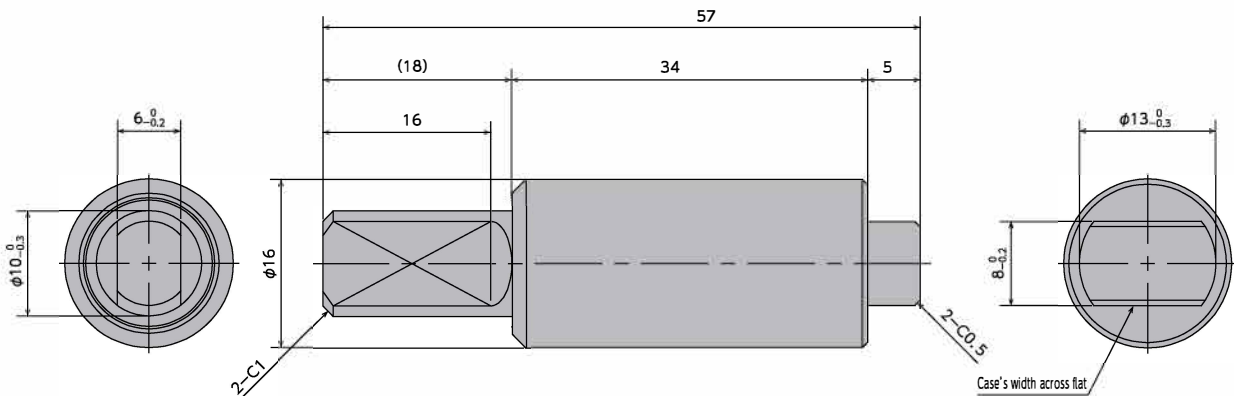
Specifications

Model	Max. torque	Reverse torque	Damping direction
FYN-U1-R103	1 N·m (10 kgf·cm)	0.5 N·m or lower (5 kgf·cm or lower)	Clockwise
FYN-U1-L103			Counter-clockwise
FYN-U1-R203	2 N·m (20 kgf·cm)	0.7 N·m or lower (7 kgf·cm or lower)	Clockwise
FYN-U1-L203			Counter-clockwise
FYN-U1-R303	3 N·m (30 kgf·cm)	0.9 N·m以下 (9 kgf·cm or lower)	Clockwise
FYN-U1-L303			Counter-clockwise

Note) Measured at 23°C±2°C

- * Max. angle 115°
- * Operating temperature -5~50°C
- * Weight 40±4g
- * Main body, rotating shaft materials Zinc die-cast (ZDC)

- * Cap material Polyphenylene Sulphide (PPS)
- * Oil type Silicone oil



How to Use the Damper

1. FYN-U1 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly.

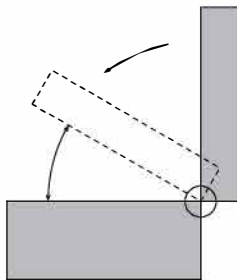


Diagram A

The damper torque becomes larger, preventing the lid from slowing down.

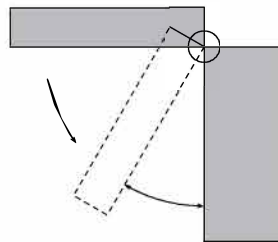


Diagram B

The damper torque becomes larger, preventing the lid from closing completely.

2. When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque. Example)

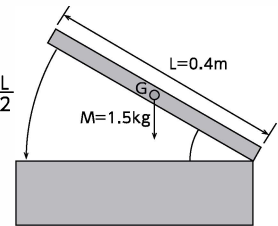
Lid mass M : 1.5kg

Lid dimensions L : 0.4m

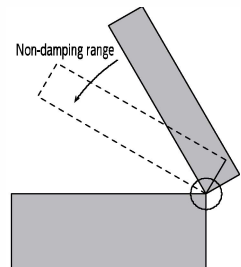
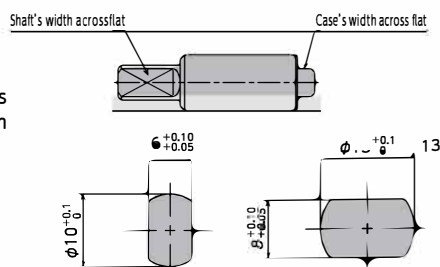
Gravity Center Position: Assumed as $\frac{1}{2}$

Load torque: $T = 1.5 \times 9.8 \times 0.4 \div 2$
 $= 2.94 \text{ N·m}$

Based on the above calculation, FYN-U1-*303 is selected.

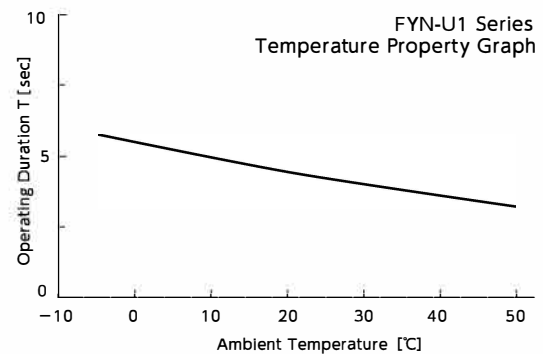


3. When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

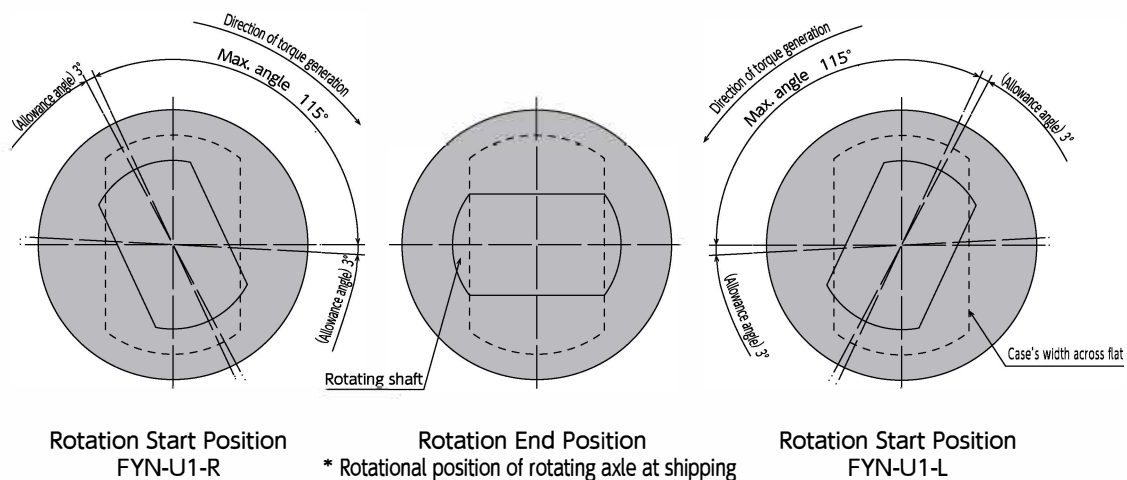


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The changes in the time it takes for the lid to close are shown in the graph to the right.



5. The damper's working angle is 110°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-C1 Series



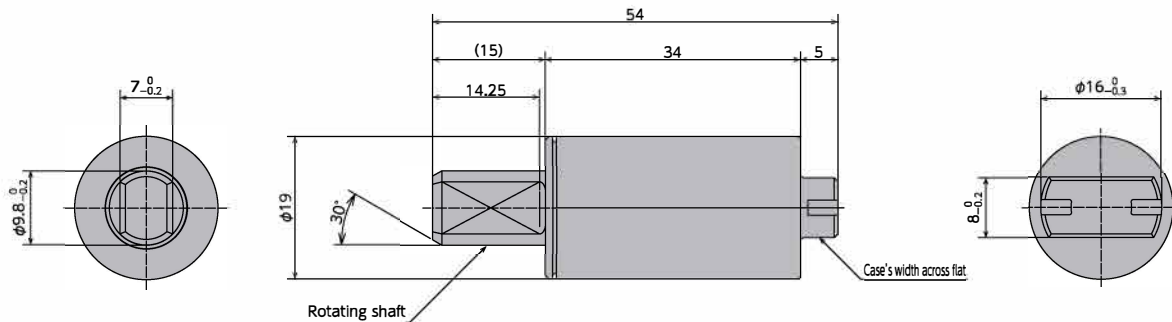
Specifications

Model	Max. torque	Reverse torque	Directions
FYN-C1-R203	2N·m (20kgf·cm)	0.3 N·m or lower (3 kgf·cm or lower)	Clockwise (CW)
FYN-C1-L203			Counterclockwise (CCW)
FYN-C1-R253	2.5N·m (25kgf·cm)	0.5 N·m or lower (5 kgf·cm or lower)	Clockwise (CW)
FYN-C1-L253			Counterclockwise (CCW)
FYN-C1-R303	3N·m (30kgf·cm)	0.7 N·m or lower (7 kgf·cm or lower)	Clockwise (CW)
FYN-C1-L303			Counterclockwise (CCW)
FYN-C1-R353	3.5N·m (35kgf·cm)	0.9 N·m or lower (9 kgf·cm or lower)	Clockwise (CW)
FYN-C1-L353			Counterclockwise (CCW)
FYN-C1-R403	4N·m (40kgf·cm)	1.1 N·m or lower (11 kgf·cm or lower)	Clockwise (CW)
FYN-C1-L403			Counterclockwise (CCW)

Note) Measured at 23°C±2°C

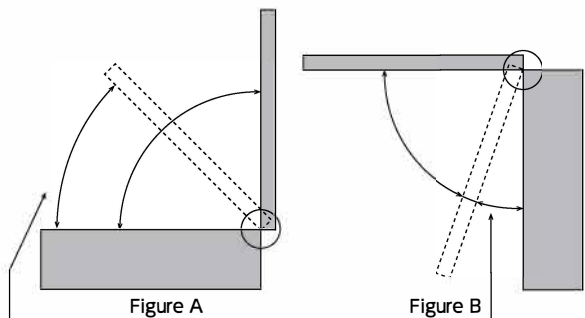
- * Max. angle 110°
- * Operating temperature -5~50°C
- * Weight 30±2g
- * Body and cap material Polybutylene terephthalate (PBT)

- * Rotating shaft material Zinc die-cast (ZDC)
- * Oil type Silicone oil



How to Use the Damper

- The FYN-C1 series has been designed so that when a lid is closing from a vertical position, as shown in Figure A, high torque is generated just before it closes completely. For a lid that closes from a horizontal position, as shown in Figure B, the strong torque generated just prior to a complete closure may prevent the lid from becoming fully closed.



Stronger damper torque allows the lid to close gently until it is fully closed.

Stronger damper torque prevents the lid from being fully closed.

- When using a damper with a lid shown in the diagram, determine the damper torque based on the following selection calculation.

Example)

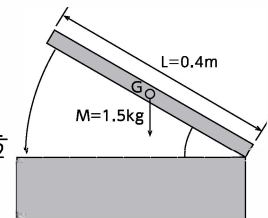
Lid weight M : 2kg

Lid dimension L : 0.4m

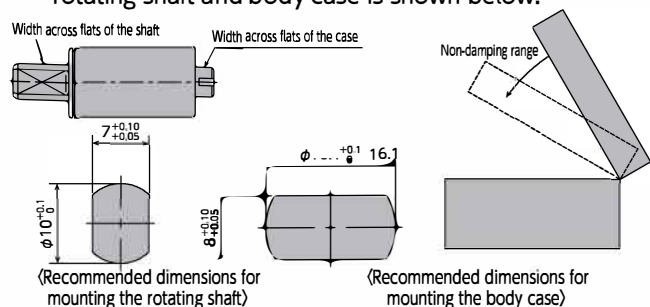
Gravity Center Position G: Assumed as $\frac{L}{2}$

Load torque : $T = 2 \times 9.8 \times 0.4 \div 2$
 $= 3.92 \text{ N} \cdot \text{m}$

Based on the above calculation, select FYN-C1-*403.

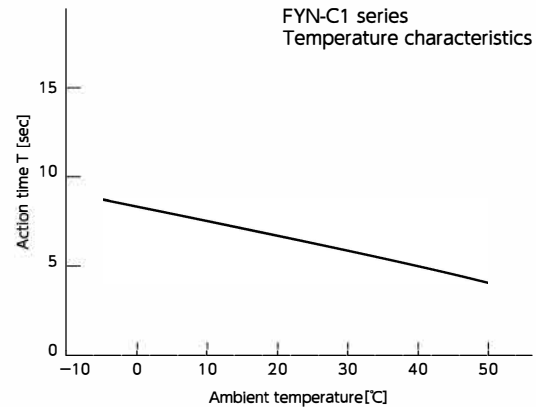


- When connecting parts that are joined to the rotating shaft, ensure a snug fit. The lid will not decelerate as designed when closing if these parts are not connected properly. The dimensional tolerance for fixing the rotating shaft and body case is shown below.

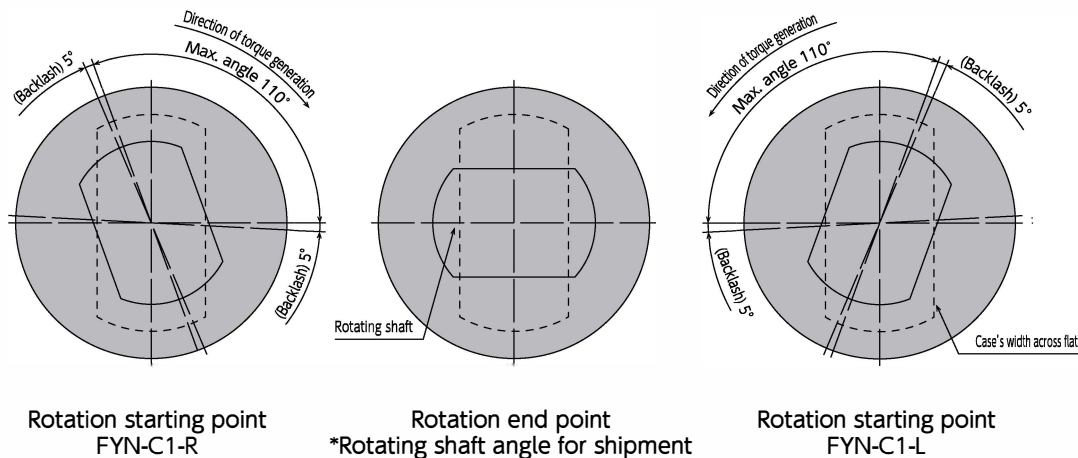


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, damper characteristics weaken as the temperature goes up, and become stronger as the temperature goes down. This occurs because the viscosity of oil inside the damper is affected by the temperature change. Once the temperature returns to normal, so will the damper characteristics. Please refer to the right diagram for change in the action time for a free-closing lid.



5. The damper action angle is 110° as shown below. Rotating it beyond this angle will cause the damper to break. Ensure that an external stopper is in place. The action angle is based on the width across flats of the case on the back of the body. The rotation end point is at 90° on the basis of the width across flats of the case. (Refer to the figure below.)



6. There are dampers that generate torque in either the clockwise or counterclockwise direction when the rotating shaft is seen from the above. Select a model according to use.

Vane Damper

FYN-D3 Series



Specifications

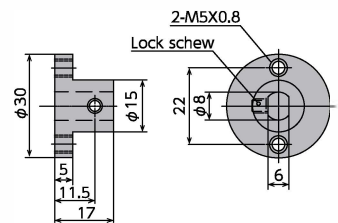
Model	Max. torque	Reverse torque	Damping direction
FYN-D3-R503	5 N·m	1 N·m or lower	Clockwise
FYN-D3-L503	(50 kgf·cm)	(10 kgf·cm or lower)	Counter-clockwise
FYN-D3-R703	7 N·m	1 N·m or lower	Clockwise
FYN-D3-L703	(70 kgf·cm)	(10 kgf·cm or lower)	Counter-clockwise
FYN-D3-R104	10 N·m	2 N·m or lower	Clockwise
FYN-D3-L104	(100 kgf·cm)	(20 kgf·cm or lower)	Counter-clockwise

- * Max. angle 180°
- * Operating temperature -5~50°C
- * Weight 215±10g
- * Body and cap material Zinc die-cast (ZDC)
- * Rotating shaft materia S25C
- * Oil type Silicone oil

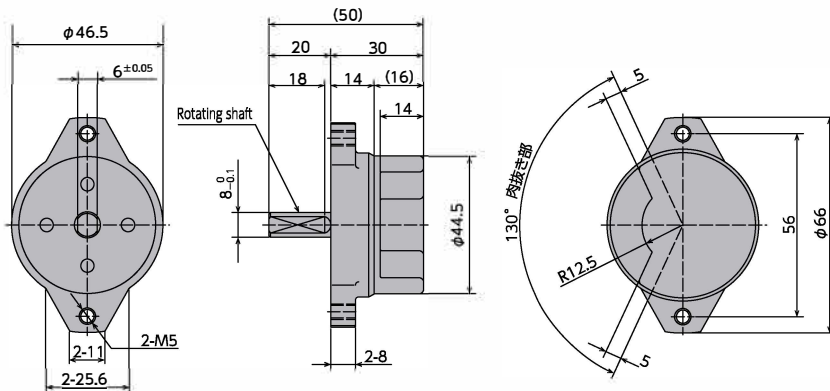
Optional Parts

Rotating shaft flange ROP-010H1

Applicable model	Model
FYN-D3	ROP-010H1

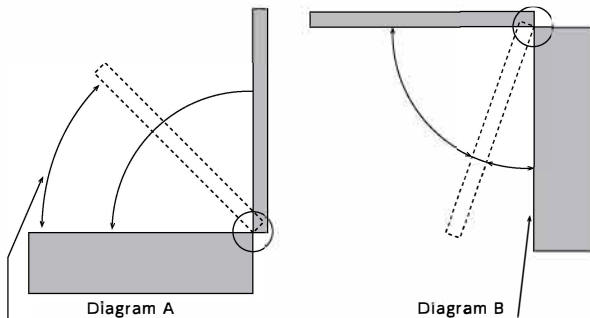


Rotating shaft flange
ROP-010H1



How to Use the Damper

- FYN-D3 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly.



he damper torque becomes larger, preventing the lid from slowing down.

The damper torque becomes larger, preventing the lid from closing completely.

The angle in which the damper torque becomes large can be customized by modifying the inside orifice.

- When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque.
Example)

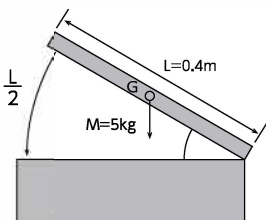
Lid mass M : 5kg

Lid dimensions L : 0.4m

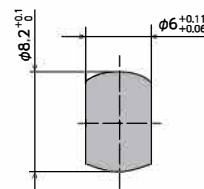
Gravity Center Position : Assumed as $\frac{1}{2}$

$$\text{Load torque : } T = 5 \times 9.8 \times 0.4 \div 2 = 9.8 \text{ N·m}$$

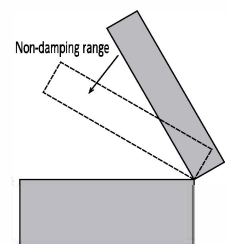
Based on the above calculation, FYN-D3-104 is selected.



- When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

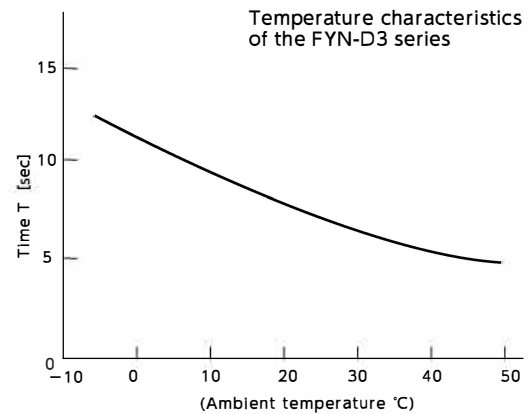


<Recommended dimensions for mounting a rotating shaft>

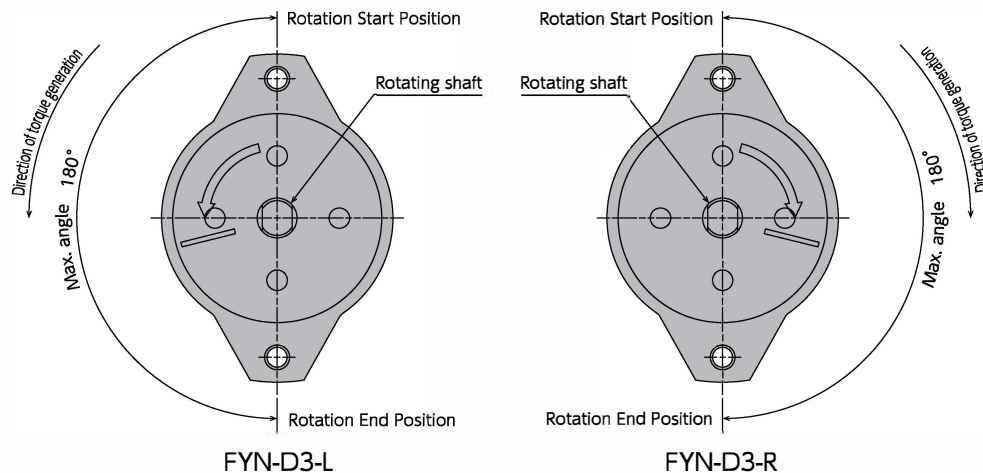


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The changes in the time it takes for the lid to close are shown in the graph to the right.



5. The damper's working angle is 110°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYT/FYN-D1(D2) Series



Specifications

Model	Max. torque	Reverse torque	Damping direction
FYT-D1 (2)-104	10 N·m (100 kgf·cm)	—	Both directions
FYN-D1 (2)-R104	10 N·m (100 kgf·cm)	0.5 N·m or lower (5 kgf·cm or lower)	Clockwise
FYN-D1 (2)-L104			Counter-clockwise

Note) Measured at 23°C±2°C
The FYT/N-D2 series has a shorter shaft length.

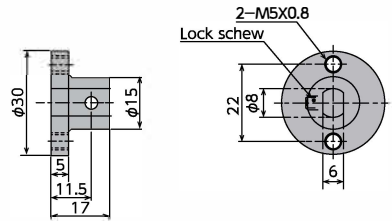
- * Max. angle 105°
- * Operating temperature -5~50°C
- * Weight D1 : 215±10g, D2 : 210±10g
- * Body and cap material Zinc die-cast (ZDC)

- * Rotating shaft material S25C
- * Oil type Silicone oil

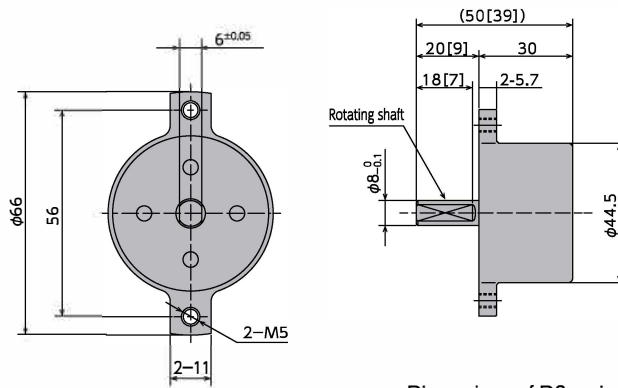
Optional Parts

Rotating shaft flange ROP-010H1

Model
ROP-010H1



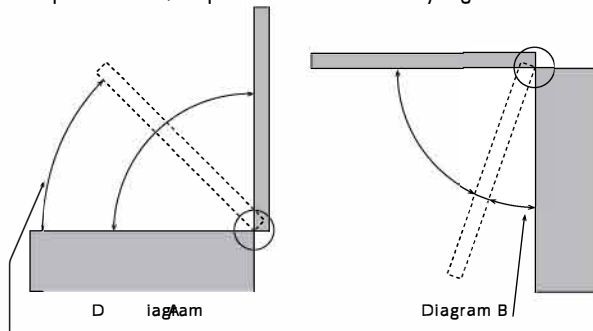
Rotating shaft flange
ROP-010H1



Dimensions of D2 series are in []

How to Use the Damper

1. The uni-directional FYN-D1 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly. Torque is generated in both clockwise and counterclockwise directions in the FYT-D1 series. Unlike the FYN-D1 series, it does not have a fixed orifice for adjusting torque. Therefore, torque remains constant at any angle.



The damper torque becomes larger, preventing the lid from slowing down.

The damper torque becomes larger, preventing the lid from closing completely.

The angle in which the damper torque becomes large can be customized by modifying the inside orifice.

2. When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque. Example)

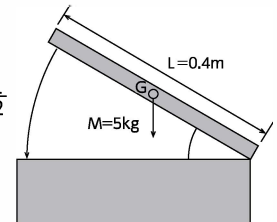
Lid mass M : 5kg

Lid dimensions L : 0.4m

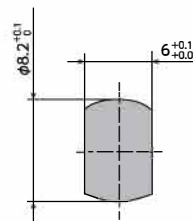
Gravity Center Position : Assumed as $\frac{1}{2}$

$$\text{Load torque : } T = 5 \times 9.8 \times 0.4 \div 2 = 9.8 \text{ N} \cdot \text{m}$$

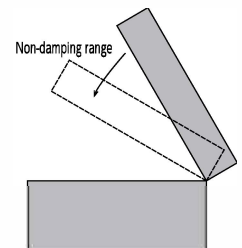
Based on the above calculation, FYN-D1-104 is selected.



3. When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

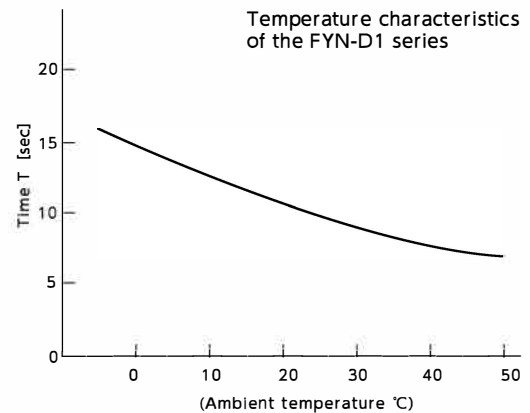


<Recommended dimensions for mounting a rotating shaft>

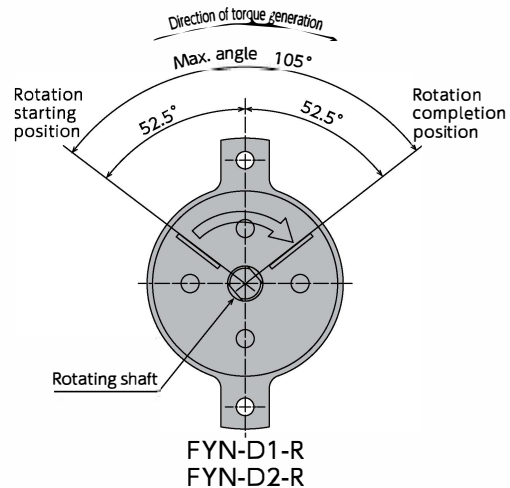
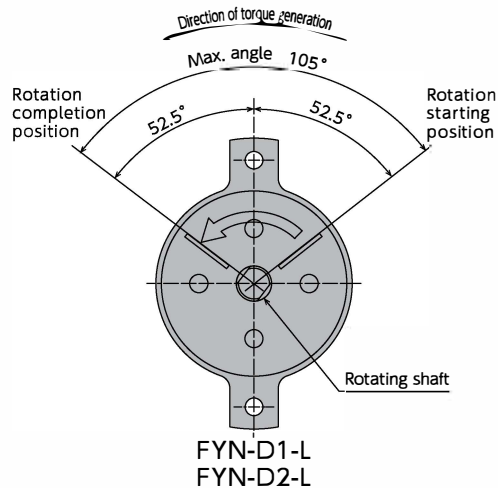


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The changes in the time it takes for the lid to close are shown in the graph to the right.



5. The damper's working angle is 110°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



6. The FYN-D1 series is a fixed type; its torque is non-adjustable. However, a customized order for a torque between the range of 2 ~20N·m is possible by changing the oil viscosity.

7. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYT/FYN-H1(H2) Series



Specifications

Model	Max. torque	Reverse torque	Damping direction
FYT-H1 (2)-104	10 N·m (100 kgf·cm)	—	Both directions
FYN-H1 (2)-R104	10 N·m (100 kgf·cm)	0.5 N·m or lower (5 kgf·cm or lower)	Clockwise
FYN-H1 (2)-L104			Counter-clockwise

Note) Measured at 23°C ± 2°C

The FYT/H-H2 series has shorter shaft length.

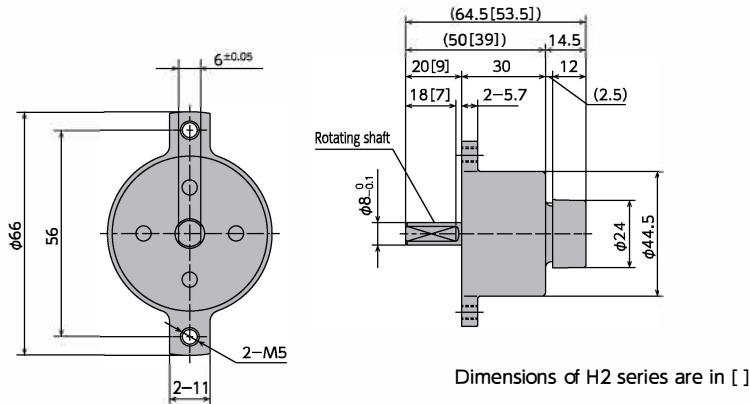
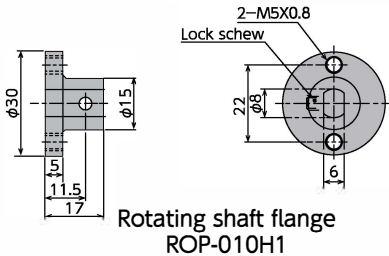
- * Max. angle 105°
- * Operating temperature -5~50°C
- * Weight H1 : 240±10g, H2 : 235±10g

- * Body and cap material Zinc die-cast (ZDC)
- * Rotating shaft material S25C
- * Oil type Silicone oil

Optional Parts

Rotating shaft flange ROP-010H1

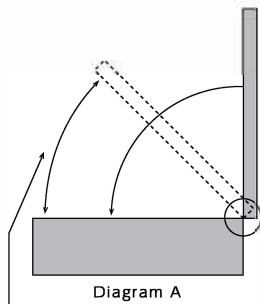
Model
ROP-010H1



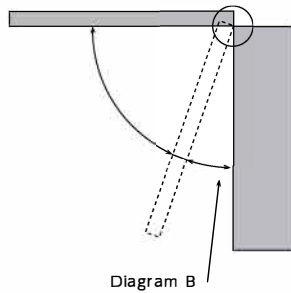
Dimensions of H2 series are in []

How to Use the Damper

- The uni-directional FYN-H1 is designed to generate a large torque just before a lid closing from a vertical position, as shown in Diagram A, comes to a full closure. When a lid is closed from a horizontal position, as shown in Diagram B, a strong torque is generated just before the lid is fully closed, causing the lid to not close properly. Torque is generated in both clockwise and counterclockwise directions in the FYT-H1 series. Unlike the FYN-H1 series, it does not have a fixed orifice for adjusting torque. Therefore, torque remains constant at any angle.



The damper torque becomes larger, preventing the lid from slowing down.



The damper torque becomes larger, preventing the lid from closing completely.

The angle in which the damper torque becomes large can be customized by modifying the inside orifice.

- When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque. Example)

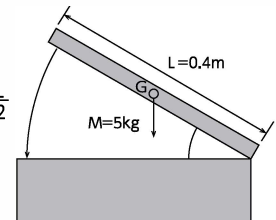
Lid mass M : 5kg

Lid dimensions L : 0.4m

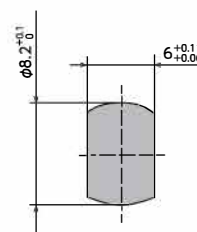
Gravity Center Position : Assumed as $\frac{1}{2}$

Load torque : $T = 5 \times 9.8 \times 0.4 \div 2$
 $= 9.8 \text{ N} \cdot \text{m}$

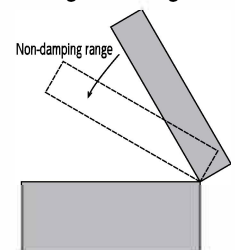
Based on the above calculation, FYN-H1-*104 is selected.



- When connecting the rotating shaft to other parts, please ensure a tight fit between them. Without a tight fit, the lid will not slow down properly when closing. The corresponding dimensions for fixing the rotating shaft and the main body are as follows.

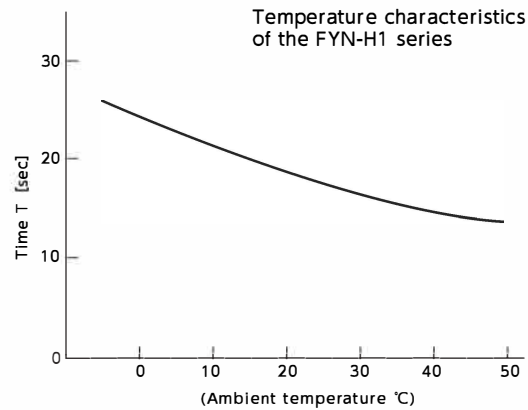


<Recommended dimensions for mounting a rotating shaft>

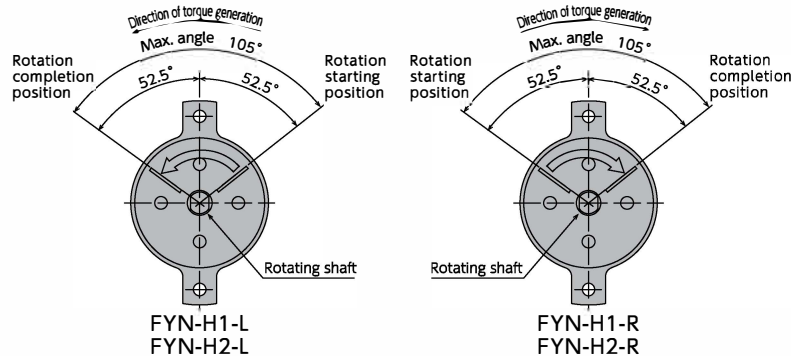


●Products specification might be changed without notice.

4. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The changes in the time it takes for the lid to close are shown in the graph to the right.

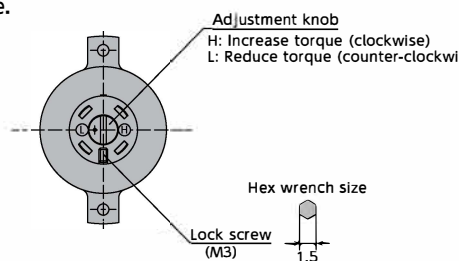


5. The damper's working angle is 110°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place. The working angle is based on the width across flat for fixing, located towards the rear end of the main body. The position where the rotation is complete is at 90° with respect to the width across flat.



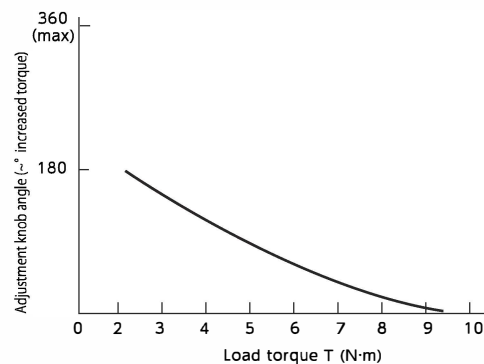
6. How to adjust the damper

- 1) In the FYT-H1 (H2) and FYN-H1 (H2) series, the amount of generated torque can be adjusted with the adjustment knob located towards the rear of the main body. Insert a screwdriver in the minus groove to turn.
- 2) Turn the adjustment knob in the H direction to increase torque.
- 3) Turn the adjustment knob in the L direction to reduce torque.
- 4) Do not turn the adjustment knob more than 360°. Turning the knob more than 360° causes the adjustment shaft to slip out, resulting in oil leakage.
- 5) Once the adjustment is complete, secure with a lock screw. Using the damper without securing it may result in fluctuating torque.



<Range of torque adjustment>

Please refer to the graph below for the relationship between torque and the adjustment knob.



7. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-S1 Series

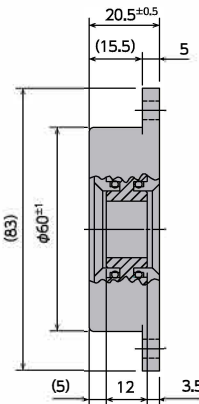
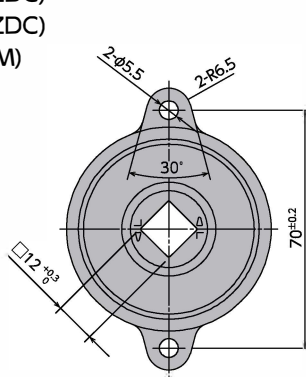


Specifications

Model	Max. torque	Reverse torque	Damping direction
FYN-S1-R104	10 N·m (100 kgf·cm)	1.5 N·m or lower (15 kgf·cm or lower)	Clockwise
FYN-S1-L104			Counter-clockwise

Note) Measured at 23°C ± 2°C

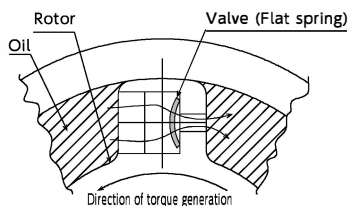
- * Max. angle 130°
- * Operating temperature -5~50°C
- * Weight 220±10g
- * Main body material Zinc die-cast (ZDC)
- * Cap material Zinc die-cast (ZDC)
- * Rotor material Polyacetal (POM)
- * Oil type Silicone oil



How to Use the Damper

1. Operating characteristics of self-adjusting oil pressure dampers

In a conventional vane damper, the damping strength (damping constant) does not change regardless of the load torque used. Because of this, its working speed is slower when the load torque is small, and faster when the load torque is large. However, because the self-adjusting FYN-S1 series is designed to self-adjust the damping force (damping constant) according to the applied load, the working speed fluctuates less compared to conventional dampers when the applied load is altered. The acceptable range of torque is 5 ~ 10 N·m. Please select your damper by referring to the motion-time graph below.

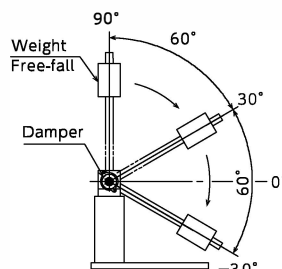
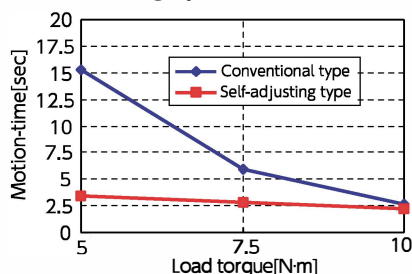


[Operating principles of the self-adjusting type]

As shown in the diagram to the left, by changing the shape of the valve (flat spring), the amount of oil flow is altered, adjusting the damper's generated torque. (PAT.P)

[Measurement conditions for the motion-time graph]

[Motion time graph]

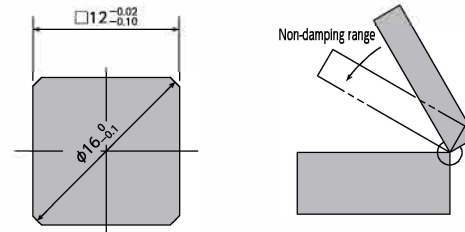


- Load torque T 5~10N·m
- Measured angle 30° ~ -30°
- Measurement temperature 23°C ± 2°C

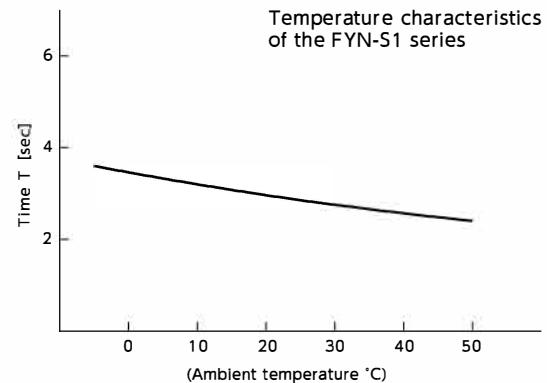
As the level of self-adjustment may vary depending on the range of the working angle of the actual work, please verify under actual working conditions before you select your damper.

●Products specification might be changed without notice.

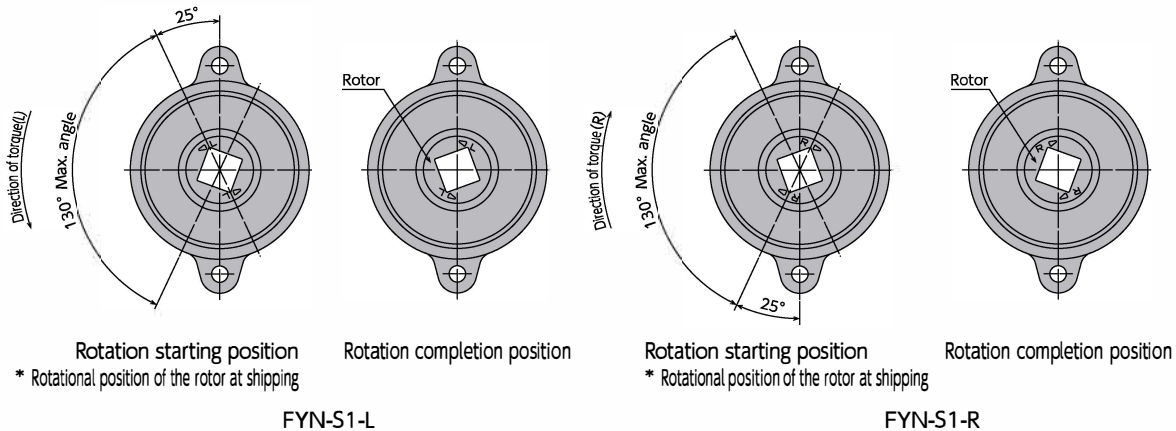
2. When using the damper, please ensure that a shaft with specified angular dimensions is inserted in the damper's shaft opening. Also, please ensure a tight fit between the shaft and the damper shaft's opening. Without a tight fit, the non-damping range becomes larger in a closing motion, etc., and it may not slow down properly. Please see the diagrams to the right for the recommended shaft dimensions for a damper.



3. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The time it takes for the lid to close is shown in the graph to the right.



4. The damper's working angle is 130°, as shown below. Rotating the damper beyond this angle will cause damage to the damper. Please ensure that an external stopper is in place.



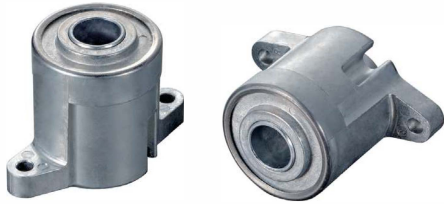
5. Because the FYN-S1 series is a self-adjusting type, the torque cannot be adjusted manually. However, by altering the viscosity of the oil, its damper characteristics can be modified. (Please contact us, as this is a custom order.)

6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-X2 Series

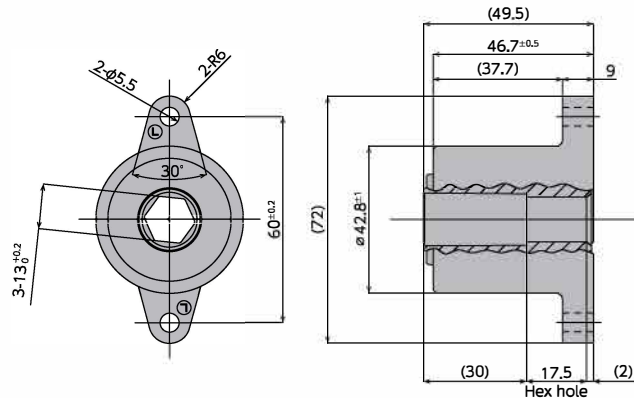
Specifications



Model	Max. torque	Reverse torque	Directions
FYN-X2-R154	15N·m (150kgf·cm)	2 N·m or lower (20kgf·cm以下)	Clockwise
FYN-X2-L154			Counterclockwise
FYN-X2-R254	25N·m (250kgf·cm)	3 N·m or lower (30 kgf·cm or lower)	Clockwise
FYN-X2-L254			Counterclockwise

Note) Measured at 23°C±2°C

- *Max. angle 106°
- *Operating temperature -5~50°C
- *Weight 287±10g
- *Body material Zinc die-cast (ZDC)
- *Cap material Zinc die-cast (ZDC)
- *Rotor material Zinc die-cast (ZDC)
- *Oil type Silicone oil



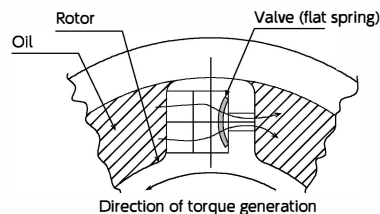
How to Use the Damper

1. Operating characteristics of self-adjusting oscillating dampers

In a conventional oscillating damper, the damping strength (damping constant) does not change regardless of the load torque used. Therefore, the operating speed is slower when the load torque is small, and faster when the load torque is large.

However, since the self-adjusting FYN-X2 series is designed to self-adjust the damping strength (damping constant) according to the applied load, its motion-time fluctuates less than that of conventional dampers when the load changes.

The acceptable range of torque is 10 to 15N·m or 20 to 25N·m. Please select your damper by referring to the motion-time graph below.

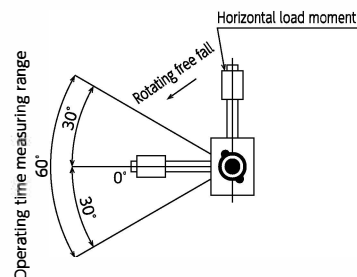
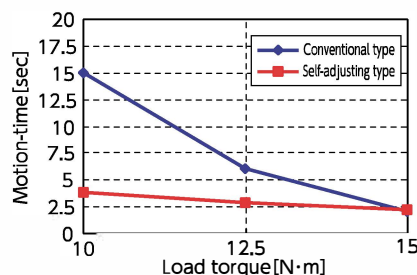
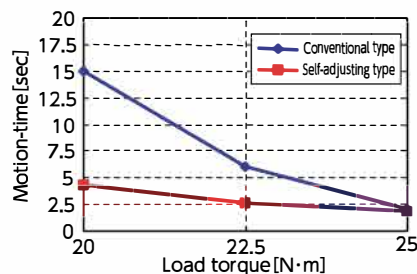


[Operating principles of the self-adjusting type]

As shown in the diagram to the left, by changing the shape of the valve (flat spring), the amount of oil flow is altered, adjusting the damper's generated torque. (PAT.P)

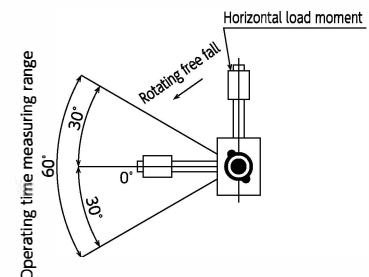
[Measurement conditions for the motion-time graph]

[Motion time graph]



FYN-X2 25N·m specification

- Measuring temperature : Room temperature (23±3°C)
- Load torque : 20~25N·m
- Measuring angle : +30°~-30°



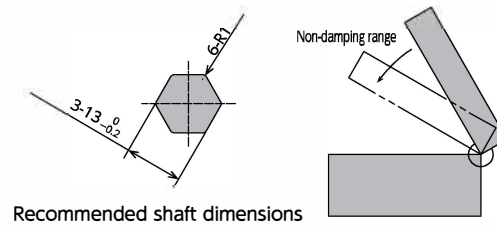
FYN-X2 15N·m specification

- Measuring temperature : Room temperature (23±3°C)
- Load torque : 10~15N·m
- Measuring angle : +30°~-30°

As the level of self-adjustment may vary depending on the range of the working angle of the actual work, please verify under actual working conditions before you select your damper.

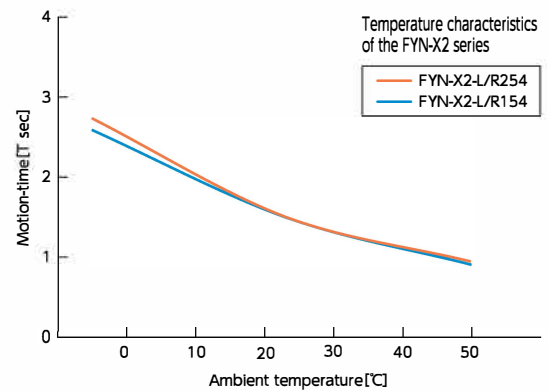
●Products specification might be changed without notice.

2. When using the damper, please ensure that a shaft with specified angular dimensions is inserted in the damper's shaft opening. Also, please ensure a tight fit between the shaft and the damper shaft's opening. Without a tight fit, the play becomes larger in a closing motion, etc., and the lid may not slow down properly. Please see the diagrams to the right for the recommended shaft dimensions for a damper.



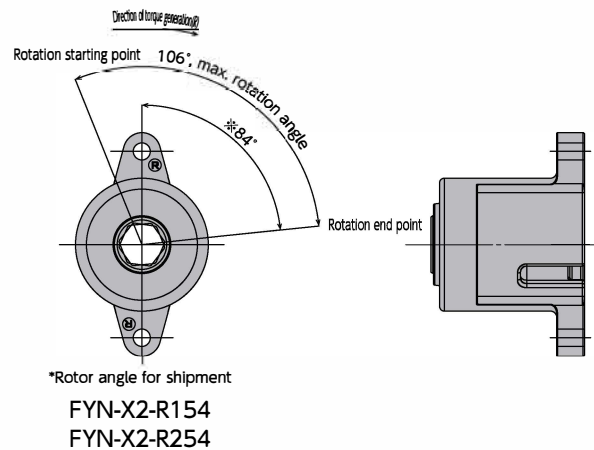
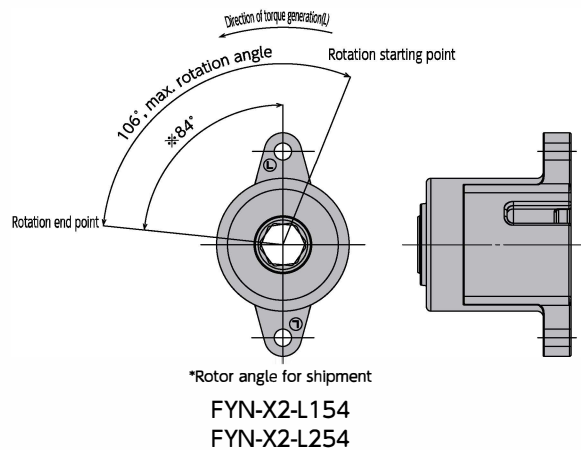
Recommended shaft dimensions

3. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The time it takes for the lid to close is shown in the graph to the right.



Temperature characteristics of the FYN-X2 series

4. The damper's working angle is 106° as shown below. Rotating the damper beyond this angle will cause the damage to the damper. Please ensure that an external stopper is in place.



5. Because the FYN-X2 series is a self-adjusting type, the torque cannot be adjusted manually. However, by altering the viscosity of the oil, its damper characteristics can be modified.

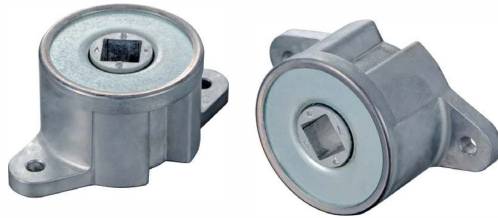
* Please contact us, as this is a custom order,

6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

FYN-Z2 Series

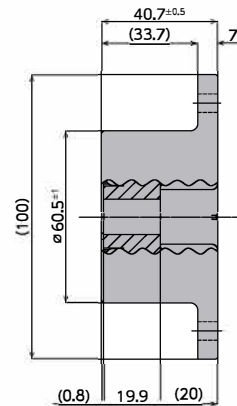
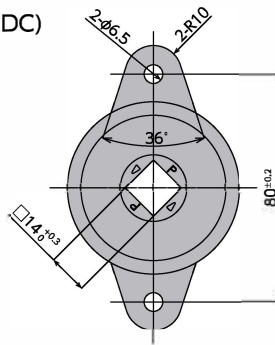
Specifications



Model	Max. torque	Reverse torque	Directions
FYN-Z2-R354	35N·m (350kgf·cm)	3 N·m or lower (30 kgf·cm or lower)	Clockwise
FYN-Z2-L354			Counterclockwise

Note) Measured at 23°C±2°C

- *Max. angle 94°
- *Operating temperature -5~50°C
- *Weight 506±10g
- *Body material Zinc die-cast (ZDC)
- *Cap material Iron (SPFC)
- *Rotor material Zinc die-cast (ZDC)
- *Oil type Silicone oil



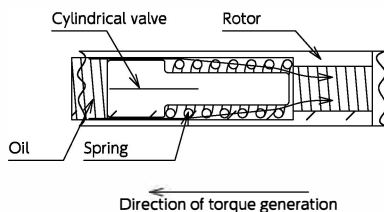
How to Use the Damper

1. Operating characteristics of self-adjusting oscillating dampers

In a conventional oscillating damper, the damping strength (damping constant) does not change regardless of the load torque used. Therefore, the operating speed is slower when the load torque is small, and faster when the load torque is large.

However, since the self-adjusting FYN-X2 series is designed to self-adjust the damping strength (damping constant) according to the applied load, its motion-time fluctuates less than that of conventional dampers when the load changes.

The acceptable range of torque is 20 to 35 N·m. Please select your damper by referring to the motion-time graph below.



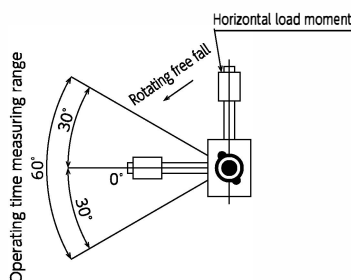
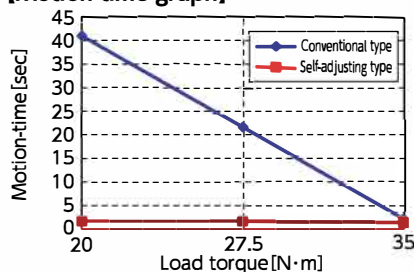
[Operating principles of the self-adjusting type]

As shown in the diagram to the left, the spring compressed by the movement of the cylindrical valve alters the amount of oil flow so as to adjust the generated torque of the damper. (Patent pending)

[Measurement conditions for the motion-time graph]

- Measuring temperature : Room temperature (23±3°C)
- Load torque : 20~35N·m
- Measuring angle : +30°~-30°

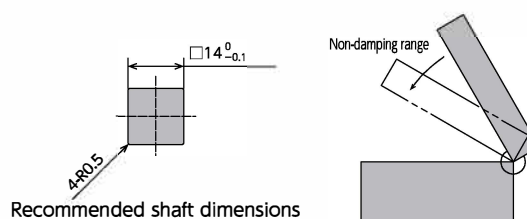
[Motion time graph]



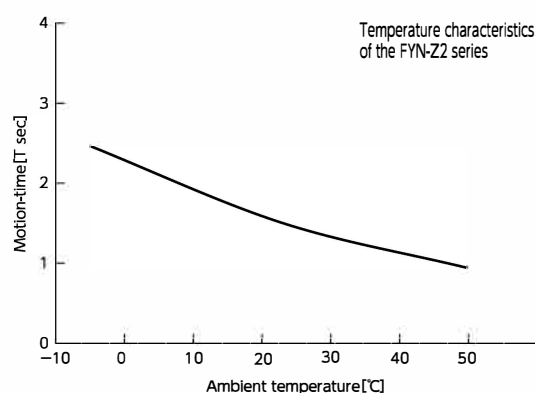
As the level of self-adjustment may vary depending on the range of the working angle of the actual work, please verify under actual working conditions before you select your damper.

●Products specification might be changed without notice.

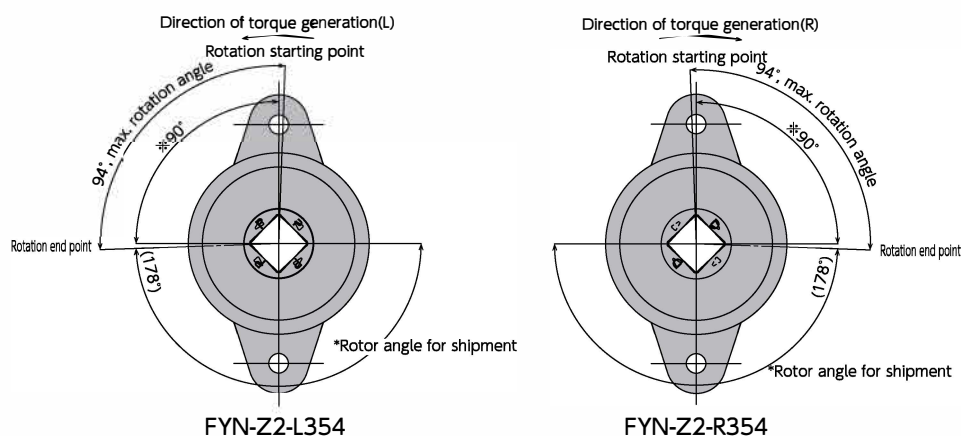
2. When using the damper, please ensure that a shaft with specified angular dimensions is inserted in the damper's shaft opening. Also, please ensure a tight fit between the shaft and the damper shaft's opening. Without a tight fit, the play becomes larger in a closing motion, etc., and the lid may not slow down properly. Please see the diagrams to the right for the recommended shaft dimensions for a damper.



3. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature increases, and become stronger as the temperature decreases. This is because the viscosity of the oil inside the damper varies according to the temperature. When the temperature returns to normal, the damper characteristics will return to normal as well. The time it takes for the lid to close is shown in the graph to the right.



4. The damper's working angle is 94° as shown below. Rotating the damper beyond this angle will cause the damage to the damper. Please ensure that an external stopper is in place.



5. Because the FYN-Z2 series is a self-adjusting type, the torque cannot be adjusted manually. However, by altering the viscosity of the oil, its damper characteristics can be modified.

* Please contact us, as this is a custom order,

6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Vane Damper

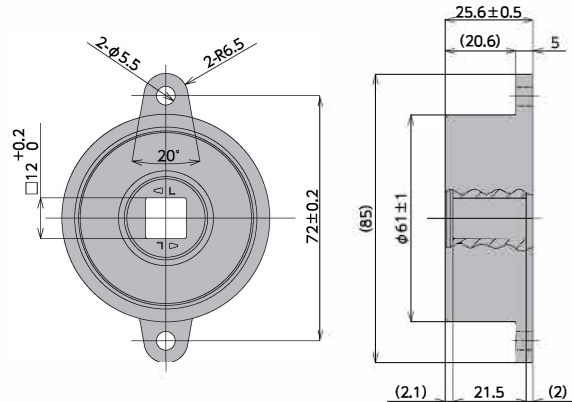
FYN-A2 Series

Specifications

Model	Max. torque	Reverse torque	Directions
FYN-A2-R204	20N·m	2N·m or lower	Clockwise
FYN-A2-L204	(200kgf·cm)	(20kgf·cm lower)	Counterclockwise

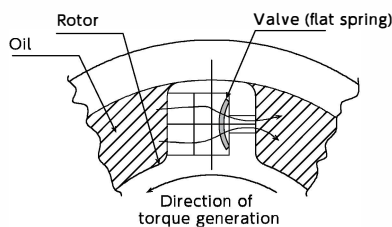


- * Max. angles 120°
- * Operating temperature -5 ~50° C
- * Weight 222 ± 11 g
- * Body material Zinc die - cast (ZDC)
- * Cap material Zinc die - cast (ZDC)
- * Rotor material Zinc die - cast (ZDC)
- * Oil type Silicone oil
- * Rotary color L: Black R: White



How to Use the Damper

- Operating characteristics of self-adjusting oscillating dampers
in a conventional oscillating damper, the damping strength (damping constant) does not change regardless of the load torque used.
Therefore, the operating speed is slower when the load torque is small, and faster when the load torque is large.
However, since the self-adjusting FYN-A2 series is designed to self-adjustable the damping strength (damping constant) according to the applied load, its motion-time fluctuates less than that of conventional dampers when the load changes.
The acceptable range of torque is 10 to 15N·m or 20 to 25N·m. Please select your damper by referring to the motion graph below.



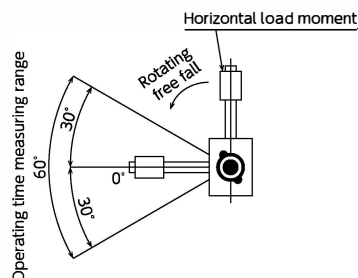
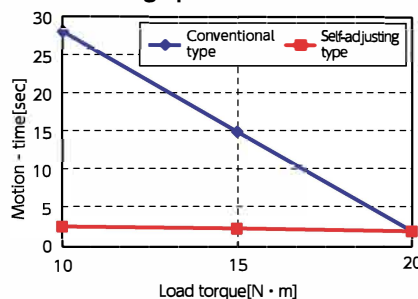
[Operating principles of the self-adjusting type]

As shown in the diagram to the left, by changing the shape of the valve (flat spring), the amount of oil flow is altered, adjusting the damper's generated torque. (PAT.P)

[Measurement conditions for the motion-time graph]

- Measuring temperature : Room temperature(23±3°C)
- Load torque : 10~20N·m
- Measuring angle : +30°~-30°

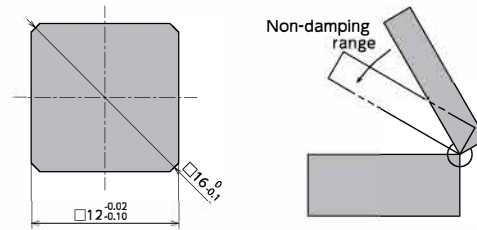
[Motion time graph]



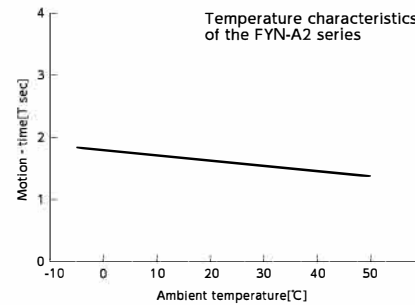
As the level of self-adjustment may vary depending on the range of the working angle of the actual work, please verify under actual working conditions before you select your damper.

●Products specification might be changed without notice.

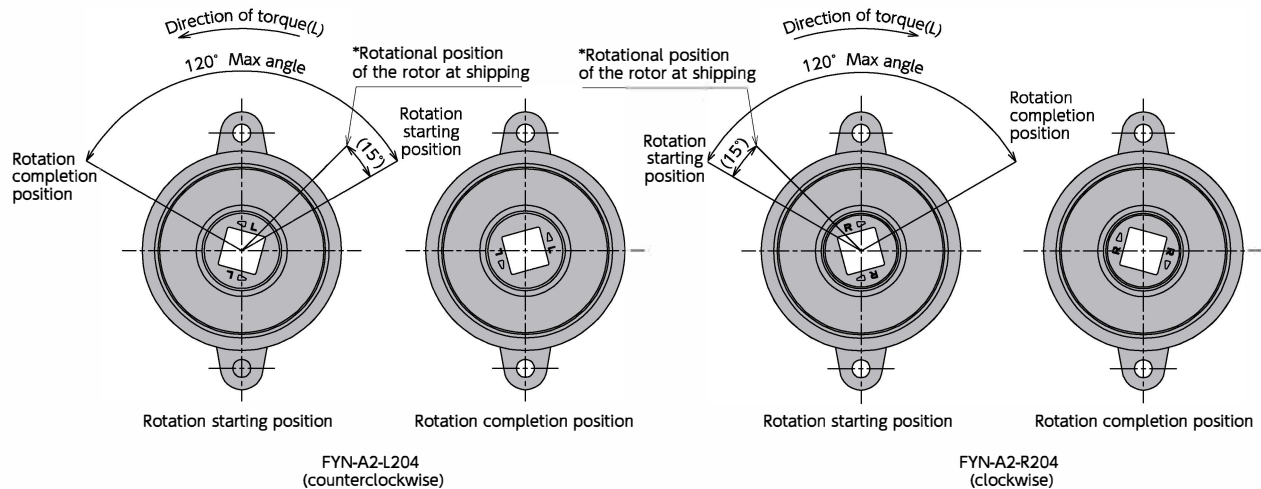
2. When using the damper, please ensure that a shaft with specified angular dimensions is inserted in the damper's shaft opening. Also, please ensure a tight fit between the shaft and the damper shaft's opening. Without a tight fit, the play becomes larger in a closing motion, etc., and the lid may not slow down properly. Please see the diagrams to the right for the recommended shaft dimensions for a damper.



3. Damper characteristics vary according to the ambient temperature. In general, the damper characteristics become weaker as the temperature decreases. This is because the viscosity of the temperature. When the temperature returns to normal, The damper characteristics will return to normal as well. The time it takes for the lid to close is shown in the graph to the right.



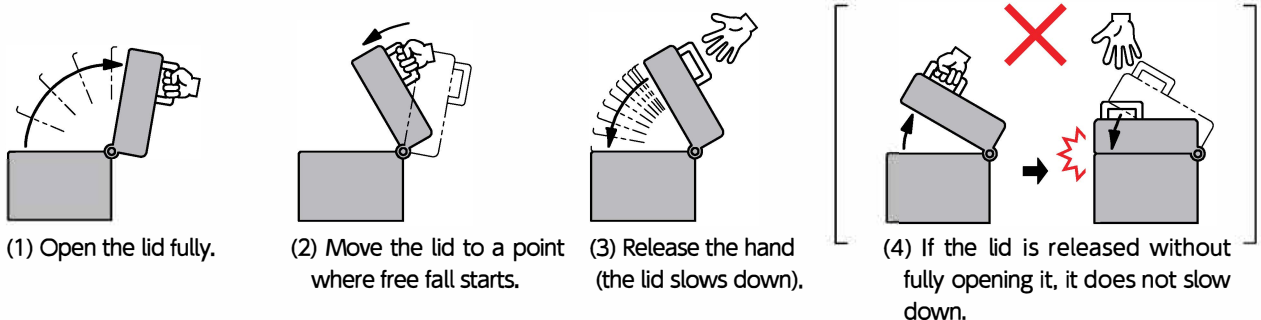
4. The damper's working angle is 120° as shown below. Rotating the damper beyond this angle will cause the damage to the damper. Please ensure that an external stopper is in place.



5. Because the FYN-A2 series is a self-adjusting type, the torque cannot be adjusted manually. However, by altering the viscosity of the oil, its damper characteristics can be modified. (Please contact us, as this is a custom order.) 6. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.

Precautions for Use

* When using the vane damper, ensure that after having fully opened the lid, move the lid to a point where free fall starts, and then release the hand from the lid. If the lid is slightly opened and in this state the hand is released, the lid may not be able to sufficiently slow down and the lid may be closed with force, which could result in an injury such as getting the hand caught by the lid.



Vane Damper

FYT/FYN-LA3 Series

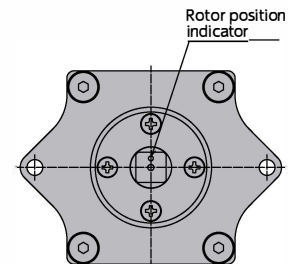
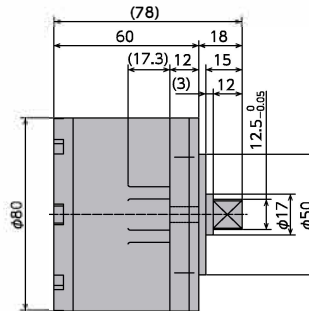
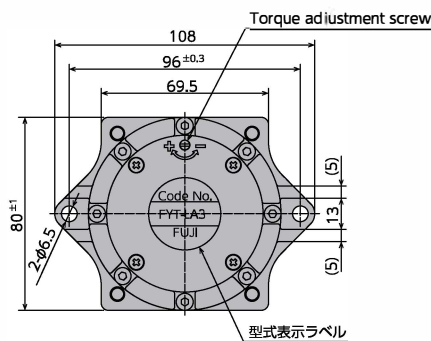


Specifications

Model	Max. torque	Damping constant	Damping direction
FYT-LA3	40N·m (400kgf·cm)	10~60N·m/(rad/sec)	Both directions
FYN-LA3-R			Clockwise
FYN-LA3-L			Counter-clockwise

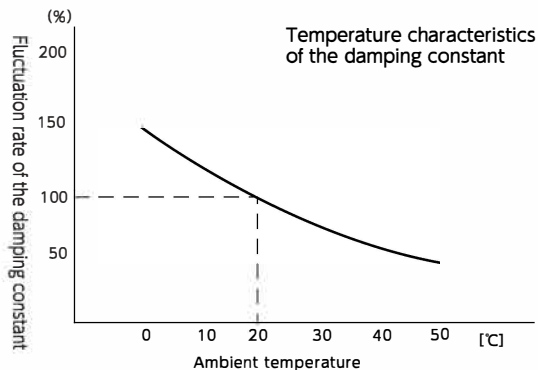
Note) Measured at 23°C±2°C

- * Max. angle 210°
- * Operating temperature 0~50°C
- * Weight 1.75k g
- * Body and cap material Zinc die-cast (ZDC)
- * Rotating shaft material Alloy steel
- * Oil type Silicone oil



How to Use the Damper

1. Damper characteristics vary according to the ambient temperature. In general, the damping constant decreases as the temperature increases, and the damping constant increases as the temperature decreases. This is because the viscosity of the oil inside the damper changes according to the temperature. When the temperature returns to normal, the damping constant will return to normal as well.



2. When using a damper on a lid, such as the one shown in the diagram, use the following selection calculation to determine the damper torque.

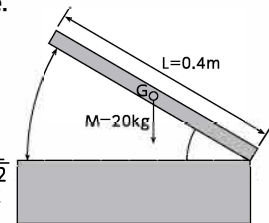
Example)

Lid mass M : 20kg

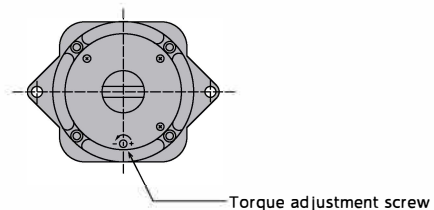
Lid dimensions L : 0.4m

Gravity Center Position : Assumed as $\frac{L}{2}$

Load torque : $T = 20 \times 0.4 \times 9.8 \div 2$
 $= 39.2\text{N}\cdot\text{m}$



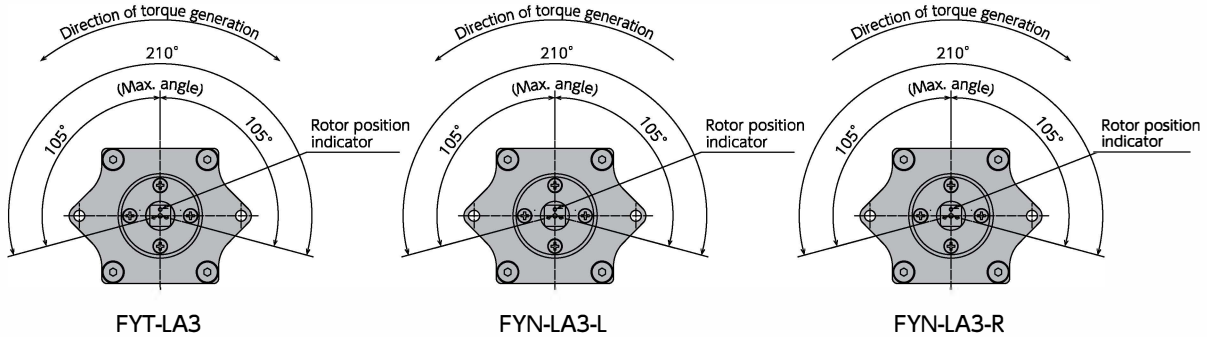
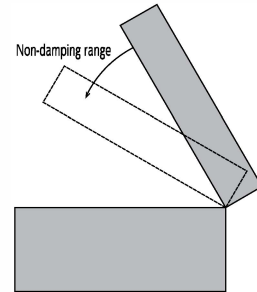
3. FYT, FYN-LA3 series are torque-adjustable types. Turn the damping adjustment screw located on the back of the main body by inserting a slotted screwdriver. The damping constant increases when turned to the + direction (right). The damping constant decreases when turned to the - direction (left).



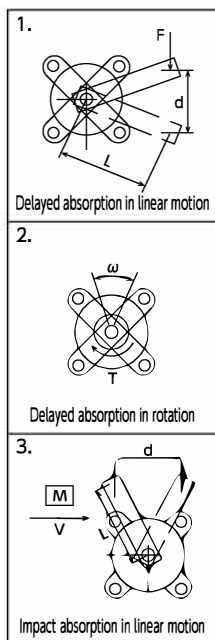
●Products specification might be changed without notice.

Instruction for Damper Attachment

1. When attaching a rotating shaft to its corresponding part, ensure that they are firmly attached together by making the gap between them as small as possible. A large gap may affect the damper's non-damping range, preventing the lid from slowing down properly.
2. The damper's working angle is $\pm 105^\circ$, as shown on the right (second diagram). Please determine where to attach it according to your needs.
3. The direction in which torque is generated varies according to the model. Please select the appropriate model for your purpose.
4. Do not use the damper as a stopper. An external stopper must be attached at the stopping position.
5. In FYN-LA3-L and FYN-LA3-R, the angular velocity in the reverse direction (opposite to the direction of torque generation) should be 1 rad/sec or less.



How to Calculate the Damping Constant for Vane Dampers



1. Delayed absorption in linear motion

$$\text{Formula (N}\cdot\text{m/(rad/sec))} = \frac{FL^2t}{d}$$

F = Force or mass applied to the lever tip (N)
L = Distance between the centre of the damper shaft and the lever's point of application (m)
d = Distance travelled by lever (m)
t = Travelling time of the lever (sec)

2. Delayed absorption in rotation

$$\text{Formula (N}\cdot\text{m/(rad/sec))} = \frac{T}{\omega}$$

T = Torque applied to shaft (N·m)
 ω = Angular velocity(rad/sec)

3. Impact absorption in linear motion

$$\text{Formula (N}\cdot\text{m/(rad/sec))} = \frac{MVL^2}{d}$$

M = Mass(kg)
V = Velocity(m/sec)
L = Distance between the centre of the damper shaft and the lever's point of application (m)
d = Distance travelled by lever (m)